

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 3, 4, 7, 11-15, 19-22, 24, 25, 27, 28, and 30-32 are pending in this application; Claims 1, 2, 5, 6, 8-10, 16, 18, 23, 26, and 29 having been canceled without prejudice or disclaimer; and Claims 3, 4, 7, 11, 15, 25, and 30-32 having been currently amended. Support for amended Claims 3, 4, 7, 11, 15, 25, and 30-32 can be found, for example, in the original claims, drawings, and specification as originally filed.¹ No new matter has been added.

In the outstanding Office Action, the claims were objected to due to informalities; Claims 6 and 7 were rejected under 35 U.S.C. § 112, second paragraph; Claims 1-7, 11, 12, 14-16, and 29-32 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sato et al. (U.S. Patent Publication No. 2003/0132701; hereinafter “Sato”); Claims 9 and 23-25 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Yu et al. (U.S. Patent Publication No. 2002/0063520; hereinafter “Yu”); Claims 8, 21, and 22 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Sylvester et al. (U.S. Patent Publication No. 2004/0252933; hereinafter “Sylvester”); and Claims 10, 13, and 26-28 were rejected under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Kuma et al. (U.S. Patent Publication No. 2003/0127968; hereinafter “Kuma”).

In response to the objection to the claims, Applicants have amended Claim 11 to correct the informality noted in the outstanding Office Action. Accordingly, Applicants respectfully submit that the objection to the claims has been overcome.

In response to the rejection of Claims 6 and 7 under 35 U.S.C. § 112, second paragraph, Applicants have canceled Claim 6, rendering the rejection moot. Accordingly,

¹ See page 6, lines 1-11 of the specification.

Applicants respectfully request that the rejection of Claims 6 and 7 under 35 U.S.C. § 112, second paragraph, be withdrawn.

In response to the rejection of Claims 1-7, 11, 12, 14-16, and 29-32 under 35 U.S.C. § 103(a) as unpatentable over Sato, Applicants have amended Claim 3 to recite features formerly of Claim 5. Applicants respectfully submit that amended independent Claim 3 recites novel features clearly not taught or rendered obvious by the applied references.

Amended independent Claim 3 is directed to a color conversion layer including, *inter alia*:

...a fluorescent medium for converting light emitted from an emitting medium to light having a longer wavelength, and

particles of an organic material and/or an inorganic material coated with a material suppressing extinction of the fluorescent medium, wherein the fluorescent medium converts light in a blue range emitted from the emitting medium to light having a longer wavelength.

Independent Claims 11 and 30 recite substantially similar features as independent Claim 3. Thus, the arguments presented below with respect to Claim 3 are also applicable to independent Claims 11 and 30.

Sato is directed to a semiconductor light emitting device such as an LED or LD (laser diode). Paragraph [0002] of Sato describes a light emitting apparatus having a color converting member which contains a LED (see Fig. 1) and a fluorescent substance (e.g. yttrium aluminum oxide fluorescent substance).² The color converting member contains an epoxy resin derived from triazine (1, 3, 5-triglycidil isocyanurate).

Sato describes that because of a high curing rate of the epoxy resin derived from triazine, the residue of the unreacted portion due to lack of the curing agent can be suppressed even when using a volatile curing agent such as acid hydride; that the epoxy resin derived

² See paragraph [0064] of Sato.

from triazine is solid (for example, powder) at normal temperature before curing and has an action of assisting dispersion of a fluorescent substance, but is converted into a transparent resin after curing; and that an optical semiconductor device, which is superior in optical characteristics and reliability, by suppressing poor curing of the resin and precipitation of the fluorescent substance occurred in the color converting member.³ Sato also describes that a diffusing agent may be added to the color converting member. Examples of the diffusing agent are described at paragraph [0069] of Sato and include barium titanate, titanium oxide, aluminum oxide and silicon oxide.⁴

Page 4 of the outstanding Office Action asserts that Sato “teaches that the inorganic particles are coated with transparent resin material which suppress extinction of fluorescent particles (paragraph 21 & 36).” However, Applicants respectfully submit that Sato does not describe such a teaching. Further, no inorganic particles (i.e. diffusing agent) are used in the examples described in Sato. Thus, Applicants respectfully submit that Sato fails to teach or suggest “a fluorescent medium for converting light emitted from an emitting medium to light having a longer wavelength, and particles of an organic material and/or an inorganic material coated with a material suppressing extinction of the fluorescent medium, wherein the fluorescent medium converts light in a blue range emitted from the emitting medium to light having a longer wavelength,” as recited in Claim 3.

Thus, Applicants respectfully submit that independent Claims 3, 11, and 30 (and all claims depending thereon) patentably distinguish over Sato. Further, Applicants respectfully submit that Yu, Sylvester, and Kuma fail to cure any of the above noted deficiencies of Sato.

Accordingly, Applicants respectfully request that the rejection of Claims 1-7, 11, 12, 14-16, and 29-32 under 35 U.S.C. § 103(a) as unpatentable over Sato be withdrawn.

³ See paragraph [0014] of Sato.

⁴ see paragraph [0069] of Sato.

In response to the rejection of Claims 9 and 23-25 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Yu, Applicants note that Claims 24 and 25 are dependent on Claim 3, and are thus believed to be patentable for at least the reasons discussed above. Claims 9 and 23 have been cancelled. Claims 24 and 25 are believed to be further patentable for the reasons discussed next.

Yu describes that a fluorescent layer 52 (color converting layer) and a color filter layer 55 are stacked, in order to improve color purity of light emitted from an emitting diode (see Figure 7 of Yu). The stacking order is light-emitting chip 30/color filter 55/fluorescent layer 52 (color converting layer) (see Figure 7 of Yu). On the other hand, the stacking order in the Applicants' invention is emitting medium/color conversion layer/color filter. The color purity of the light passed through the color conversion layer is improved by the color filter.⁵ Thus, Yu and the present invention are different from each other in the stacking order, and consequently, in the constitution. Namely, in Yu, light incident to the color conversion layer is improved in the color purity of light by the color filter, while in the present invention, light emitted from the color conversion layer is improved in the color purity by the color filter.

Accordingly, Applicants respectfully request that the rejection of Claims 9 and 23-25 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Yu be withdrawn.

In response to the rejection of Claims 8, 21, and 22 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Sylvester, Applicants note that Claims 21 and 22 are dependent on Claim 3 and are thus believed to be patentable as described above. Claim 8 has been cancelled. Claims 21 and 21 are believed to be further patentable for the reasons discussed next.

⁵ See paragraph [0036] of the specification.

Sylvester describes that the scattering particles may be composed of a very fine, powder of particles or micro-spheres, which may be solid or hollow, to scatter the light within the color converter 14 to assist in the spreading and converting the color of the light.⁶

Paragraph [0030] of Applicants' specification describes that when the hollow particles are used, the difference in the refractive index between the air (in the hollow portion) and the binder resin is large (the refractive index of the air is 1.0 while that of the binder resin is from approximately 1.5 to 1.6) so that *the effect of scattering light is large*. Namely, the present invention teaches that when the hollow particles are used, light scattering within the color conversion layer is likely to occur, so that haze value becomes higher, and a great amount of the light radiated into the color conversion layer is scattered inside the layer, so that a long light path is given in the color conversion layer.⁷ Sylvester does not teach or suggest the haze value of the color converter, and the differences between in the cases where the particles are solid or hollow.

Accordingly, Applicants respectfully request the rejection of Claims 8, 21, and 22 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Sylvester be withdrawn.

In response to the rejection of Claims 10, 13, and 26-28 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Kuma, Applicants note that Claim 13 is dependent on Claim 11, and Claims 27 and 28 are dependent on Claim 3 and are thus believed to be patentable as described above. Claims 10 and 26 have been cancelled. Claims 13, 27, and 28 are believed to be further patentable for the reasons discussed next.

Claims 27 and 28 recite that "the color conversion layer is a layer in which a material of the fluorescent medium and a material of a color filter are mixed." Paragraph [0003] of Kuma indicates that Figure 6 referred to in the outstanding Office Action, shows a color luminous device described in U.S. Patent No. 6,084,347. Kuma describes that in the color

⁶ See paragraph [0043] of Sylvester.

⁷ See paragraph [0012] of Sylvester.

luminous device 10 of U.S. Patent No. 6,084,347, each of the light-adjusting members 32, 34 and 36 contains a fluorescent dye which absorbs a specific color and emits fluorescence in a different color, or color filter pigment which blocks the transmission of a specific color in a mixture form.⁸

Kuma proposes a color luminous device as shown in Figure 1 wherein a color-converting member (color conversion layer) and a color filter are stacked, since good performance cannot be obtained by the light-adjusting member (color conversion layer) in which a fluorescent dye and a color filter pigment are mixed, Kuma teaches away from mixing a fluorescent dye and a color filter material. Accordingly, there is no motivation for a person of ordinary skill in the art to employ such a mixture. Further, Kuma describes an organic electroluminescent device, but does not teach or suggest the haze value of the color conversion layer.

Accordingly, Applicants respectfully request that the rejection of Claims 10, 13, and 26-28 under 35 U.S.C. § 103(a) as unpatentable over Sato in view of Kuma be withdrawn.

⁸ See paragraph [0003] of Kuma.

Consequently, in view of the present amendment, and in light of the above discussion, the pending claims as presented herewith are believed to be in condition for formal allowance, and an early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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